

### Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

#### Listing of Claims:

1-20. (cancelled)

21. (currently amended) A method, ~~method comprising the steps of:~~

providing a disk drive having a disk and a write head for writing data to a disk surface and a read head for reading data from the said disk surface;

5 sensing a temperature of the a disk drive in order to determine an optimal write current for said write head associated with said temperature;

determining a maximum write current which satisfies a predetermined bit error rate associated with writing data to the disk using the head; then

10 determining whether the maximum write current ~~which satisfies said predetermined bit error rate~~ satisfies a write induced instability test associated with reading data from the said disk surface using the said read head; and

if the said maximum write current which satisfies said predetermined bit error rate does not satisfy the said write induced instability test, then reducing the said maximum write current until the said write induced instability test is satisfied.

22. (currently amended) The method of claim 21, ~~21~~-wherein the said write induced instability test includes the steps of:

5 writing a test sequence to multiple data sectors on the said-disk surface using the maximum write current and the head ~~which satisfies said predetermined bit error rate;~~  
and  
reading servo sector position data from the disk using the said read-head immediately after ~~said step of writing~~ the test sequence.

23. (currently amended) The method of claim 22, 22 wherein the said write induced instability test is not satisfied if an error exists in reading the servo sector position data.

24. (currently amended) The method of claim 21, wherein 21 ~~wherein, if the said~~ maximum write current ~~which satisfies said predetermined bit error rate does~~ satisfies the ~~satisfy said~~ write induced instability test, then  
determining whether the said maximum write current ~~which satisfies said~~  
5 ~~predetermined bit error rate also~~ satisfies a pole tip protrusion test associated with the  
head; and

if the said maximum write current ~~which satisfies said predetermined bit error~~  
~~rate does not satisfy the said~~ pole tip protrusion test, then reducing the said maximum write current until the said pole tip protrusion test is satisfied.

25. (currently amended) A method for providing a temperature compensated write current signal in a disk drive, comprising:

measuring a temperature of the said disk drive, ~~wherein said disk drive is at a first temperature;~~

5            writing ~~a first sequence of data~~ to a first track of a ~~magnetic storage disk~~ using a head as first transducer head, ~~wherein a first write current is amount and a first write current boost amount are supplied to the said first transducer head;~~

             writing data to second and third tracks adjacent to the said first track as the track, ~~wherein said first write current is amount and said first write current boost amount are~~  
10           supplied to the said first transducer head;

             reading the said data from the said first track using the head;

determining, ~~wherein a bit error rate for the said data read from the first track using the head is determined;~~

             in response to the a-bit error rate that is within a predetermined bit error rate,  
15           increasing the at least one of said write current amount and said write current boost amount and repeating the said steps of writing data to the first, second and third tracks as the increased write current is supplied to the head;

             in response to the a-bit error rate exceeding the that exceeds said predetermined  
20           bit error rate, decreasing the at least one of said write current amount and said write current boost amount;

             setting at least one of a first nominal write current amount and a first nominal write current boost amount equal to an amount that does not result in the a-bit error rate exceeding the that exceeds said predetermined bit error rate; then

             writing ~~a second sequence of data~~ to a track of the said magnetic storage disk as  
25           the nominal write current is supplied to the head to determine whether the first nominal

~~write current and the first nominal write current boost will subject said first transducer head to write induced instabilities; and~~

in response to detecting at least one of an error reading servo sector position information from the track using the head and a position error signal indicating a change in position of the said first transducer head relative to the track of at least a first magnitude, decreasing the at least one of said first nominal write current amount and said first nominal write current boost amount.

26. (currently amended) The method of claim 25, further comprising decreasing the nominal write current in response to detecting the error comprising:

— ~~measuring a temperature of said disk drive, wherein said disk drive is at a second temperature;~~

— ~~altering at least one of said first nominal write current amount and said first nominal write current boost amount to obtain at least one of a temperature compensated write current amount and write current boost amount;~~

— ~~providing said at least one of said temperature compensated write current amount and said temperature compensated write current boost amount to said transducer head.~~

27. (currently amended) The method of claim 26, wherein the error is due to write induced instability of the head ~~said step of altering comprises:~~

— ~~applying said second temperature to an algorithm to obtain a correction amount;~~  
and

5        ~~applying said correction amount to at least one of said first nominal write current amount and said first nominal write current boost amount.~~

28. (new) The method of claim 25, further comprising decreasing the nominal write current in response to the position error signal indicating the change in position of the head.

29. (new) The method of claim 25, wherein the change in position of the head is due to pole tip protrusion of the head.

30. (new) The method of claim 25, further comprising:

decreasing the nominal write current in response to detecting the error due to write induced instability of the head; and

5        decreasing the nominal write current in response to the position error signal indicating the change in position of the head due to pole tip protrusion of the head.

31. (new) In a disk drive that includes a disk and a head that reads from and writes to the disk, wherein the head writes to the disk in response to a write current, a method of compensating the write current for a temperature of the disk drive, the method of comprising:

5        measuring an ambient temperature of the disk drive;

providing a first write current with acceptable bit error rate at the ambient temperature by adjusting an initial write current; and then

providing a second write current with acceptable stability of the head at the ambient temperature by adjusting the first write current.

32. (new) The method of claim 31, wherein measuring the ambient temperature includes measuring an internal temperature of the disk drive using a temperature sensor in the disk drive and determining the ambient temperature based on the internal temperature.

33. (new) The method of claim 32, wherein the temperature sensor is in a read/write channel in the disk drive.

34. (new) The method of claim 32, wherein the temperature sensor is in a preamplifier in the disk drive.

35. (new) The method of claim 32, wherein the temperature sensor is in a cavity in the disk drive.

36. (new) The method of claim 31, wherein providing the first write current includes:

writing a test sequence to the disk using the head;

reading the test sequence from the disk using the head;

measuring a bit error rate of the read test sequence;

comparing the measured bit error rate to a threshold; and  
changing the write current in response to the comparison.

37. (new) The method of claim 36, including increasing the write current if the measured bit error rate is less than the threshold.

38. (new) The method of claim 36, including decreasing the write current if the measured bit error rate is greater than the threshold.

39. (new) The method of claim 36, including increasing the write current if the measured bit error rate is less than the threshold and then repeating the writing, the reading, the bit error rate measuring, the comparing and the changing for the increased write current.

40. (new) The method of claim 36, including decreasing the write current if the measured bit error rate is greater than the threshold and then repeating the writing, the reading, the bit error rate measuring, the comparing and the changing for the decreased write current.

41. (new) The method of claim 31, wherein providing the second write current includes:

reading servo information from the disk using the head; and  
changing the write current in response to an error in the read servo information.

42. (new) The method of claim 41, including writing a test sequence to the disk using the head, thereby heating the head, and then reading the servo information immediately following writing the test sequence.

43. (new) The method of claim 41, including generating the error in response to failing to recover gray code in the servo information.

44. (new) The method of claim 41, including decreasing the write current in response to the error.

45. (new) The method of claim 41, including decreasing the write current in response to the error and then repeating the reading and the changing for the decreased write current.

46. (new) The method of claim 31, including providing a third write current with acceptable pole tip protrusion of the head at the ambient temperature by adjusting the second write current.



47. (new) The method of claim 46, including:

reading servo information from the disk using the head;

generating a position error signal in response to the read servo information;

comparing the position error signal to a threshold; and

5 changing the write current in response to the comparison.

48. (new) The method of claim 47, including changing the write current in

response to an abrupt change in the position error signal.

49. (new) The method of claim 47, including decreasing the write current if the

position error signal is greater than the threshold.

50. (new) The method of claim 47, including decreasing the write current if the

position error signal is greater than the threshold and then repeating the reading, the

generating, the comparing and the changing for the decreased write current.

51. (new) In a disk drive that includes a disk and a head that reads from and writes

to the disk, wherein the head writes to the disk in response to a write current, a method of

compensating the write current for a temperature of the disk drive, the method of

comprising:

5 measuring an ambient temperature of the disk drive using a temperature sensor in

the disk drive;

providing a first write current with acceptable bit error rate at the ambient temperature, starting with an initial write current, by:

- (i) writing a first test sequence to the disk using the head;
- 10 (ii) reading the first test sequence from the disk using the head;
- (iii) measuring a bit error rate of the read first test sequence;
- (iv) comparing the measured bit error rate to a threshold; and
- (v) changing the write current in response to the comparison; and then

providing a second write current with acceptable stability of the head at the ambient temperature, starting with the first write current, by:

- (vi) writing a second test sequence to the disk using the head;
  - (vii) reading servo information from the disk using the head immediately following writing the second test sequence; and
  - (viii) decreasing the write current in response to an error in the read servo
- 20 information.

52. (new) The method of claim 51, including increasing the write current in step (v) if the measured bit error rate is less than the threshold.

53. (new) The method of claim 51, including decreasing the write current in step (v) if the measured bit error rate is greater than the threshold.

54. (new) The method of claim 51, including generating the error in step (viii) in response to failing to recover gray code in the servo information.

55. (new) The method of claim 51, including providing a third write current with acceptable pole tip protrusion of the head at the ambient temperature, starting with the second write current, by:

(ix) writing a third test sequence to the disk using the head;

5 (x) reading servo information from the disk using the head immediately following writing the third test sequence;

(xi) generating a position error signal in response to the read servo information; and

10 (xii) decreasing the write current in response to an abrupt change in the position error signal.

56. (new) The method of claim 55, including writing the second and third test sequences in steps (vi) and (ix) as the same test sequence on a track on the disk, and reading the servo information in steps (vii) and (x) from the track.

57. (new) The method of claim 51, including providing the first write current as a maximum write current with acceptable bit error rate, and providing the second write current as a maximum write current with acceptable stability of the head.

58. (new) The method of claim 51, including performing the method on a zone-by-zone basis for each zone on the disk.

59. (new) The method of claim 51, including performing the method on a head-by-head basis for each head in the disk drive.

60. (new) The method of claim 51, including performing the method on an ambient temperature by ambient temperature basis for multiple ambient temperatures of the disk drive above and below an ambient temperature range.

61. (new) In a disk drive that includes a disk and a head that reads from and writes to the disk, wherein the head writes to the disk in response to a write current, a method of compensating the write current for a temperature of the disk drive, the method of comprising:

5           measuring an ambient temperature of the disk drive using a temperature sensor in the disk drive;

          providing a first write current with acceptable bit error rate at the ambient temperature, starting with an initial write current, by:

- 10           (i) writing a first test sequence to the disk using the head;
- (ii) reading the first test sequence from the disk using the head;
- (iii) measuring a bit error rate of the read first test sequence;
- (iv) comparing the measured bit error rate to a threshold; and

(v) increasing the write current and repeating steps (i) through (v) if the measured bit error rate is less than the threshold, otherwise setting the first write current to the write current in step (i); and then

providing a second write current with acceptable stability of the head at the ambient temperature, starting with the first write current, by:

(vi) writing a second test sequence to the disk using the head;

(vii) reading servo information from the disk using the head immediately

following writing the second test sequence; and

(viii) decreasing the write current and repeating steps (vi) through (viii) in response to an error in the read servo information, otherwise setting the second write current to the write current in step (vi).

62. (new) The method of claim 61, wherein increasing the write current in step (v) enables the head to sufficiently magnetize the disk during write operations.

63. (new) The method of claim 61, wherein increasing the write current in step (v) enables the head to reliably encode data on the disk during write operations.

64. (new) The method of claim 61, including generating the error in step (viii) in response to failing to recover gray code in the servo information.

65. (new) The method of claim 61, including providing a third write current with acceptable pole tip protrusion of the head at the ambient temperature, starting with the second write current, by:

(ix) writing a third test sequence to the disk using the head;

5 (x) reading servo information from the disk using the head immediately following writing the third test sequence;

(xi) generating a position error signal in response to the read servo information; and

10 (xii) decreasing the write current and repeating steps (ix) through (xii) in response to an abrupt change in the position error signal error, otherwise setting the third write current to the write current in step (ix).

66. (new) The method of claim 65, including writing the second and third test sequences in steps (vi) and (ix) as the same test sequence on a track on the disk, and reading the servo information in steps (vii) and (x) from the track.

67. (new) The method of claim 61, including providing the first write current as a maximum write current with acceptable bit error rate, and providing the second write current as a maximum write current with acceptable stability of the head.

68. (new) The method of claim 61, including performing the method on a zone-by-zone basis for each zone on the disk.

69. (new) The method of claim 61, including performing the method on a head-by-head basis for each head in the disk drive.

70. (new) The method of claim 61, including performing the method on an ambient temperature by ambient temperature basis for multiple ambient temperatures of the disk drive above and below an ambient temperature range.